Open Access

Stechnolock: Journal of Nursing Education

Research Article

The Impact of Relaxation Techniques on Perceived Stress and Satisfaction with Life among Nursing Students: A Mixed-Methods Study

Denny MM[*1], Stiglic G[1,2], Borko P[3], Stante A[1], Pajnkihar M[1], Demsar A[3] and Cilar L[1]

[1]*University of Maribor, Faculty of Health Sciences, Maribor, Slovenia*

[2]*Faculty of Electrical Engineering and Computer Science, University of Maribor, Maribor, Slovenia*

[3]*University of Maribor, Department of Psychology, Faculty of Philosophy, Maribor, Slovenia*

[*]Corresponding Author: Denny MM, Professor, PhD, RN, University of Maribor, Faculty of Health Sciences, Žitna ulica 15, 2000 Maribor, Slovenia, Tel: 00353872039898, E-mail: denny.margaret@gmail.com

Citation: Denny MM, Stiglic G, Borko P, Stante A, Pajnkihar M, et al. (2022) The Impact of Relaxation Techniques on Perceived Stress and Satisfaction with Life among Nursing Students: A Mixed-Methods Study. Stechnolock J Nurs Educ 1(1): 101

Abstract

Background: Nursing students and allied health professionals experience high levels of stress, which is due to the complex interplay of everyday obligations in nursing.

Aim: This study aimed to determine common stressors among first year nursing students.

Design: A fixed mixed-methods study was conducted using a non-equivalent control (NEC) group pre-test post-test design and focus groups. The treatment group (TG) participated in a stress intervention workshop. Both groups participated in focus groups.

Material and Methods: The sample consisted of 64 persons, 54 females (84.4%) and 10 males (15.6%). Participants from both groups completed the Perceived Stress Scale (PSS) and the Satisfaction with Life Scale (SWLS) questionnaires, pre and post their first clinical practicum in an older adult care facility. Qualitative data was collected using semi-structured interviews.

Results: The PSS-10 showed that the treatment group presented with more stress at the beginning of the students' clinical practicum then the NEC group (M(38)=16.13, M(26)=14.45.The decrease in the PSS score was larger in the TG than in the NEC groups. In both groups there was a decrease in the perceived stress score, but it was stronger in the treatment group (M(t1)-M(t2))=1.68, t(37)=1.78, p=0.083; when compared to the non-equivalent control group (M(t1)-M(t2))=-0.12, t(25)=0.12, p=0.902. Three main themes that emerged from the focus groups were, coping with stress in clinical and academic environments and using relaxation techniques.

Conclusion: Further research is required in this important area of undergraduate nursing and it elemental that a stress prevention and management module should be a mandatory in nursing curricula.

Keywords: Nursing; Relaxation Techniques; Stress; Nursing Students

Introduction

Stress can affect the daily life of the individual, both personally and professionally and care giving professions are particularly susceptible (Lovell, et al., 2015). Stress is a complex phenomenon and is defined differently by various theorists. McCarthy et al. (2018), define stress as a dynamic process that can be induced by external and internal stressors and the interaction between stressors. Results of a study by Lätsch (2018), showed that satisfaction with life, gender and locus of control are significant predictors of stress. McCarthy et al., (2018) conducted a research study with students in third level education found that frequent behavioural changes occurred due to stress, which resulted from less leisure time activities and the inability to maintain a more normal balanced working tempo. According to Chopra (2019), Karaman, (2019) and Crawford et al. (2015), there is interconnection between stress and mental health presentations amongst students generally and these pose major challenges for universities. Additionally, Frögéli et al. (2016, p. 2015) highlighted important and sometimes overlooked contributing factors, such as organizational stressors and especially in nursing due to both the theoretical and practicum component of programs of study [1-10].

Background

Nursing students and allied health professionals experience high levels of stress and are exposed to many different types of stressors, mainly due to both academic and clinical experiences (McCarthy, et al., 2019. These stressors revolve around patient contact, role responsibility, confidence, role expectations, academic demands and time and economic pressures, which are not unique to nursing, but more pervasive in caring professions. The manifestations of such stress in undergraduate nursing result in cognitive, emotional, physiological, behavioural and mental presentations, with resultant fear, anxiety, ineffective coping and illness as the main sequelae (Menap, et al., 2019; McCarthy, et al., 2019). This is due to the complex interplay of everyday obligations in undergraduate nursing, for example, practicum experiences, private life, academic performance, students' ability or inability to have work life balance and ultimately this affects nursing student's performance both academically and clinically (Bhurtun, et al., 2019; Yusufov, et al., 2018; Labrague, et al., 2017; Stacey, et al., 2017; Hamaideh, et al., 2016). Manap, et al. (2019) support the contention that the prevalence of mental health issues, due to stress among nursing students, is increasing and has impacted on their academic and clinical performance. Moreover, the majority of students who are faced with these problems do not get the much-needed help that they require (Dalky & Gharaibeh, 2018). Some contemporary studies have focused on university-based interventions to reduce stress among nursing students, for example, mindfulness-based training has evidenced a decrease in psychological stress among in those students who participated in such training (Cheli, et al., 2020; Lu, et al., 20019). According to Beanlands et al. (2019) dialectical behaviour therapy-skills group interventions has evidenced decreases in levels of stress and improved well-being in this group [11-13].

Yusufov et al. (2019) conducted meta-analysis to evaluate the efficacy of various stress reduction intervention programs and the findings showed that relaxation training, mindfulness-based interventions and psychoeducation were effective in reducing nursing students' anxiety, but results were limited because of the paucity of follow up data. Regular exercise or practicing different selected relaxation techniques was also shown to impart many positive effects on the individual's physical and mental health (Ružič, 2016). Aly's (2020) research supports the contention that physical activities and recreational opportunities impact in a positive way on students' well-being. While Tančič Grum and Zupančič-Tisovec, (2017) cite relaxation techniques as having positive biopsychosocial stress effects, Torabizadeh et al. (2016), found that progressive muscle relaxation and support groups can significantly reduce the anxiety levels of nursing students. Combining music with relaxation was found to decrease levels of stress, as did simple deep breathing relaxation techniques (Inangil et al.,2020 &Ariga, 2019). A noteworthy finding by Devakani et al. (2019, p. 49), in their research with student nurses, concluded that *"psychological distress was increased in first year nursing students, which was greatly reduced in final year nursing students"*. Devakani et al. (2019) study highlights the finding that it is important to use targeted interventions, specifically, with first year undergraduate nursing students in relation to stress management and prevention. McCarthy et al. (2018, p.197) in their integrative review, reinforce this message and they also support the contention that stress is "*pervasive in nursing and midwifery*". She posits that "*nursing and midwifery educators need to be cognisant of the impact of stress on undergraduate nursing students.*" She suggests that appropriate supports should be implemented both in academic and practica environments to alleviate such stressors [14-17].

Further research is needed in order to measure student nurses' perceived stress levels, satisfaction with life and their perceptions about stress interventions programs, which could be effective in ameliorating stress during their academic education, but especially during first year practica components of nursing programs of study. Therefore, it is important to give due consideration to the idea of stress management and prevention intervention programs should be included in first year undergraduate nursing study programs [18-20].

Materials and Methods

Aim

The aim of this study was to measure the comparative effectiveness of a stress intervention program in enabling undergraduate nursing students to adapt coping mechanisms to manage and prevent stress during a clinical practicum.

Research questions

1. What are the levels of perceived stress in student nurses, ascertained by Perceived Stress Scale-10 scale (PSS-10);
2. What are levels of life satisfaction and well-being, as ascertained by Satisfaction with Life Scale (SWLS);
3. What effect has a stress intervention workshop on first year nursing student's ability to prevent and manage stress during a clinical practicum;
4. What are nursing student's perception of stress and stressors in academic life and during clinical practicum.

Design

A fixed mixed-methods design was used that included a non-equivalent pretest-posttest control group and focus groups (Cook &Campbell, 1979; Denny et al., 2017). The fixed mixed method design (Figure 1) allowed the researchers to measure and compare PSS-10 and SWLS scores between pretest and posttest of both the treatment group and the nonequivalent control group. The focus groups afforded both groups the opportunity to reflect on their practicum experiences; thereby allowing the researchers to gain a more in-dept understanding of stress and satisfaction with life amongst student nurses during these specific clinical practicua (Shorten & Smith, 2017; Schoonenboom, & Burke Johnson, 2017; Creswell & Plano Clark, 2007) [21-25].

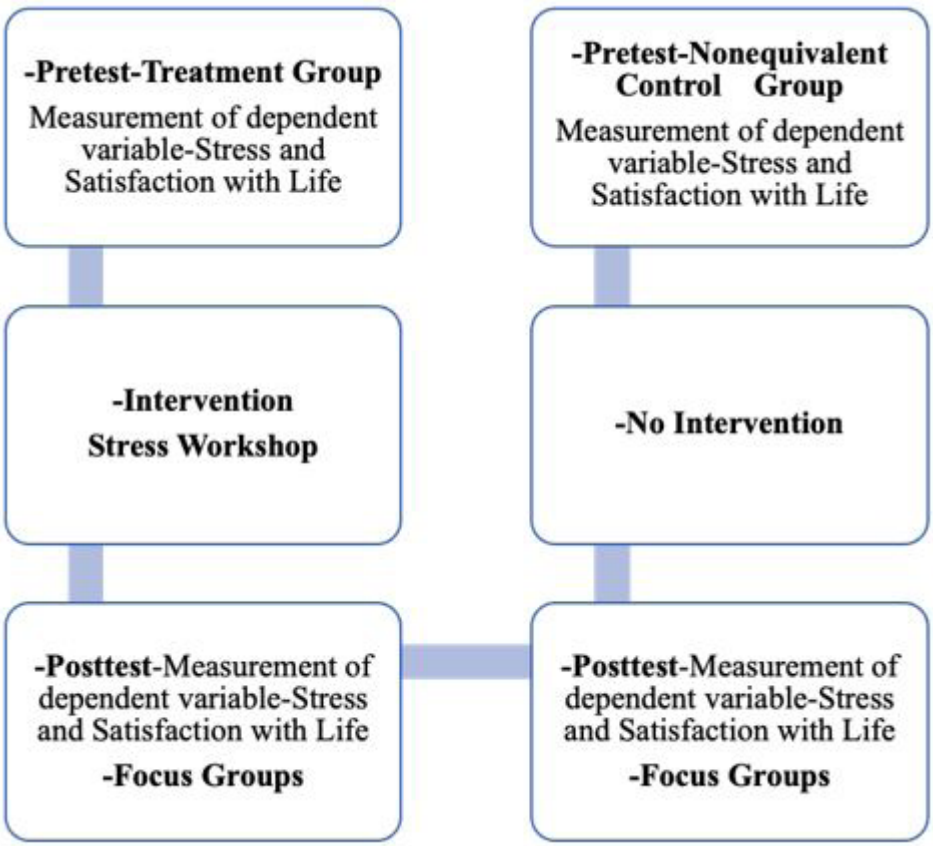

Figure 1: Mixed methods design

This fixed method design augmented the breadth and depth of understanding of the research findings and strengthened the research conclusions (Creswell, 2014; Wisdom & Creswell, 2011; Creswell & Plank, 2011) [26-28].

Setting

The study was undertaken at a Faculty in Slovenia, which offers a three-year full-time undergraduate nursing study program.

Participants

A total of 64 (n=64) first year nursing students participated in the study. They were divided in two groups, a nonequivalent control group (n=26) and a treatment group (n=38). All participants undertook clinical practicua in different older adult care facilities.

Ethical considerations and data availability

All participants who undertook the study gave informed consent. The protocol for the research was approved by the Ethical questions committee at the University. Provisions of the Declaration of Helsinki in 1995 were followed in the study.

Sampling

Convenience sampling frame was used for the quantitative study, as it can assist in overcoming many of the limitations associated with sampling in research in nursing education programs, where random selection is not always possible due to constraints of programs and timing of delivery and practicua timelines (Denny, 2010). Purposive sampling (Patton, 2002) was used to select participants for the focus groups.

Measures

Satisfaction with Life Scale (SWLS-Diener, Emmons, Larsen & Griffin, 1985) and the Perceived Stress Scale (PSS-10, Cohen, 1994) were used with both groups. The sociodemographic characteristics included participants', gender, age, form of study, marital status, religion. The SWLS was used in this study as it measures global life satisfaction and is widely used for assessing well-being, as the researchers were interested in measuring nursing students' satisfaction with life as a whole (Diener, et al.,1985; Jovanović, 2019; Lorenzo-Seva, et al., 2019). In answering the SWLS questionnaire, participants indicate how much they agree or disagree with each of the 5 items, using a 7-point Likert scale. Studies have shown that Cronbach's alpha indexes ranged from 0.79 to 0.91 in a number of studies, thus showing a high internal consistency (Galanakis, et al., 2017; Clench-Aas, Nes, Dalgard, & Aarø, 2011; Hultell & Gustavsson, 2008; Pavot & Diener, 1993, 2008; Vazquez, Duque & Hervas, 2013; van Beuningen, 2012; Hultell & Gustavsson, 2008; Vera-Villarroel, Urzua, Pavez, CelisAtenas & Silva, 2012). Cronbach's alpha in the present study was $\alpha = 0.78$ [29-36].

The PSS-10 is a global measure of perceived stress in one's life over the past month. The PSS -10 scale was used as the researchers were interested in measuring student nurses' perception of stress. Using the PSS respondents' rate how unpredictable, uncontrollable, and overloaded they feel in their lives (Cohen, Kamark & Mermelstein, 1983). The PSS-10 scale is comprised of 10 items and participants indicate how often they feel or thought in a certain way on a 5- point Likert scale. The higher scores reflect a higher level of perceived stress (items are rated from 0 (never) to 4 (very often), resulting in a maximum score of 40. The 10-item version of the PSS-10 shows a good reliability of $\alpha = 0.78$ to 0.91 (Rosenkranz, et al., 2020). In the present study, the reliability of the PSS-10 was $\alpha = 0.86$ and met the cut-off of $\alpha > 0.70$, consistent with other studies (Boram Lee & Hye In Jeong, 2019; Raczova, Hricova & Lovasova, 2018). Participants were asked how frequently they used yoga, meditation, mindfulness, sports, progressive muscle relaxation, breathing techniques, visualization in a typical week. They also had the opportunity to add additional stress techniques that they were using, which were not listed under the question. Both scales, SWLS and the PSS-10, are in the public domain for research purposes, therefore no specific permission from the authors was necessitated [37-40].

Procedure

Before conducting the study, first year nursing students were informed about the aim of the study and were invited to participate. Participants (n=64) who agreed to participate were then assigned to a nonequivalent control or a treatment group, which was based on the specific time that they commenced their first clinical practicum (those who started early were assigned to the nonequivalent control group, and those who started later in the semester were assigned to the treatment group. At the beginning of their clinical practicum the treatment group participated in a workshop, where they learned about the management and prevention of stress and basic relaxation interventions, such as, deep breathing, progressive muscle relaxation and visualization techniques. The workshop lasted two hours and it was facilitated by the authors of this paper. Participants in the treatment group completed the PSS-10 and SWLS, prior to the intervention (before they entered the clinical environment) and were asked to practice at least one relaxation technique every day during clinical practicum. At the end of each week, they were asked to report on how many times they managed to perform a relaxation intervention technique. Upon completion of their clinical practicum, participants filled out both questionnaires again. Participants in the control group also completed the questionnaires, PSS-10 and SWLS, before and after their clinical practicum, but did not receive an intervention. However, the control group, the end of the qualitative data collection, was afforded the opportunity (ethical consideration) to participate in a stress management and prevention workshop, similar to the treatment group.

For a more detailed understanding of the experience of stress in the working and academic environment, two months later, a selected number of participants from both the treatment control groups were invited to participate in separate focus groups to discuss their experiences during the study and how they coped with daily stressors. Three focus groups were conducted using semi-structured interviews, which were audio recorded and transcribed. Students were divided into six groups based on their availability. Out of 64 nursing students 31 (48.4%) responded to the invitation to participate in three focus groups with 12, 8 and 11 participants, respectively. Baseline quantitative data was first collected in March 2018 and in a 1-month follow up, more precisely the data were then collected 3-5 weeks after the initial survey using questionnaires. Qualitative data was collected using semi-structured interviews.

Data analysis

The results the quantitative and qualitative analysis were analyzed separately and then key conclusions were made (Halcomb & Hickman, 2015 Creswell; Plano Clark, 2007) [41-43].

Quantitative data analyses were conducted using SPSS (Version 24). Descriptive statistics were conducted for all variables, which were measured pre and post students' three-week clinical practicum. Skewness and kurtosis values were in the range of -2 and 2, indicating a normal distribution. Therefore, parametrical tests were used to analyses the data. Mean score change (M(t1)-M(t2)) were calculated separately for the variables of the PSS-10 and SWLS scales for each group. Cohen's d for within subjects' change was calculated with where m stands for mean, s represents standard deviation and r represents correlation between both variables. The mean score changes between the pre and post-test were conducted using paired sample t-test.

In the qualitative analysis, a systematic approach for coding data was used (Creswell, 2014). The descriptive statements were categorized into themes and subthemes that represented the area of interest. The themes, were then used to form three main analytical themes, coping with stress in clinical environment', coping with stress in academic environment and relaxation [44].

Results

Group comparison

All nursing students were enrolled in a nursing study program. Nine (14.06%) out of 64 students had no previous experience with clinical work. Others who had work experience and had worked on average 33 months (SD=17.71). The following section presents the results, comparing the nonequivalent control and treatment groups (Table 1).

		Min	Max	M	SD	S
Control group (n = 26)	Relaxation 1	0.00	6.00	2.73	1.80	0.04
	Relaxation 2	0.00	9.00	3.31	2.43	0.55
	SWLS1	21.00	34.00	27.23	3.56	- 0.01
	SWLS2	20.00	34.00	27.77	3.68	- 0.40
	PSS1	5.00	24.00	14.38	4.62	0.09
	PSS2	5.00	23.00	14.26	4.64	- 0.37
Treatment group (n = 38)	Relaxation1	0.00	8.00	3.00	2.11	0.61
	Relaxation2	0.00	11.00	3.29	2.69	1.28
	SWLS1	19.00	34.00	26.58	3.31	- 0.12
	SWLS2	20.00	34.00	27.55	3.92	- 0.22
	PSS1	6.00	25.00	16.13	4.77	- 0.26
	PSS2	5.00	25.00	14.45	5.22	0.02

Table 1: Descriptive statistics of variables measured before and after clinical practice

The total sample consisted of 64 persons, of which 54 were female (84.4%) and 10 males (15.6%). The average age was 19.39 years (SD=0.58). Fifty-five participants (85.9%) already had experience in health care, whilst 9 (14.1%) had no previous experience. There were 26 students in the control group. Of these, 20 were female (76.9%) and 6 males (23.0%), their average age was 19.31 years, 23 nursing students (88.5%) had already had health care work experience before starting their studies, while three nursing students (11.5%) did not have any previous work experience. There were 38 nursing students in the treatment group, of which 34 were female (89.5%) and 4 males (10.5%). Twenty-eight (84.2%) of the students had already had health care work experience before the start of their studies, while 6 students (15.8%) did not have experience.

Measuring the number of times nursing students relaxed during a one-week period (Variable-Relaxation) there was a surge in both groups after the students' clinical practicum, as seen in Tables 1 and 2.

		$(M(t_1)-M(t_2))$	SD	t	df	P value
Control group (n = 26)	Relaxation	- 0.58	2.77	- 1.06	25	0.299
	SWLS	- 0.54	1.94	- 1.41	25	0.170
	PSS	0.12	4.75	0.12	25	0.902
Treatment group (n = 38)	Relaxation	- 0.29	2.45	- 0.73	37	0.471
	SWLS	- 0.97	3.74	- 1.61	37	0.117
	PSS	1.68	5.83	1.78	37	0.083

Table 2: Group comparison of mean score of change in relaxation, satisfaction in life and perceived stress

The nonequivalent control group had a lower mean score at the beginning of the practicum (M (26) =2.73, M (38) =3.00; Table 1) and also a larger surge after their clinical practicum (M(t1)-M(t2)) =-0.58, t(25)=- 1,06, p=0.299; Table 2) when compared to the treatment group (M(t1)-M(t2))=-0.29, t(37)=-0.73, p=0.471; Table 2). Within the control group there was an effect size of 0.271, standard deviation units and within the group, with an intervention effect size of 0.120.

Both groups showed a small surge in their satisfaction with life (SWLS) after their clinical practicum as shown in Tables 1 and 2. The treatment group had a slightly lower SWLS score mean then the nonequivalent control group at the beginning of their clinical practicum (M(38)=26.58, M(26)=27.23; Table 1) and also a slightly higher surge in their SWLS score mean after their clinical practicum (M(t1)-M(t2))=-0.97, t(25)=-0.73, p=0.117; Table 2) when compared to the control group (M(t1)-M(t2)=-0.54, t(37)=-1.41, p=0.170; Table 2). The effect size for the intervention group was 0.267 and 0.149 for the control group.

Considering the PSS-10 score mean, the treatment group presented with more stress at the beginning of the students' clinical practicum then the control group (M (38) =16.13, M (26) =14.45; Table 1). In both groups there was a decrease in the perceived stress score, but it was stronger in the treatment group (M(t1)-M(t2))=1.68, t(37)=1.78, p=0.083; Table 2) when compared to the nonequivalent control group (M(t1)-M(t2))=-0.12, t(25)=0.12, p=0.902; Table 2). The effect size for the treatment group was 0.336 and 0.026 for the control group.

Qualitative interview analysis

According to the data analysis 59 descriptive codes were formed and were divided into 21 subthemes. These subthemes were used to form the three main analytical themes, 1) 'Coping with stress in clinical environment' 2), 'Coping with stress in academic environment' and 3) 'Relaxation' (All subthemes and descriptive codes can be seen in Table 3).

Analytical themes	Subthemes	Descriptive codes
Coping with stress in clinical environment	Stress before clinical practicum	Feeling insecure before clinical practicum Older students' descriptions of clinical practicum
	Feeling more stress at the beginning of clinical practicum	Beginnings are stressful New environment Individuals usually get accommodated to the environment/assignments
	Inexperience and lack of knowledge	Not knowing their assignments Not knowing their co-workers Not knowing how work is organized
	Stressful situations	Death Urgent situations Violent patients Patient fixation
Coping with stress in the academic environment (continues on next page)	Attitude and affect	Attitude of co-workers to students Attitude of co-workers to patients Emotional work
	Mentorship	Difference how student's work and how other employees work No quality mentorship In need of mentors who oversees students and gives them feedback
	Insecurity	Feeling insecure when working independently Feeling of having too much responsibility
	Working with elderly	Not inducing stress in cooperation
	Workload	Not to demanding Working more gives you more experience which is good in the long run Work loading from other employees Accumulation of liabilities

Coping with stress in academic environment	High levels of stress	During the whole academic year
	Exam period	To many exams Badly distributed exams All exams at once No midterm exams
	Busy schedule	Badly organized schedule Unevenly distributed workload Too much workload Having a lot of homework assignments Having obligations from morning till evening
	Concerns about choosing the right study program	Having concerns about choosing the right study program for them
	Equal treatment for all students	Choosing when do you want to have your clinical practice Impartiality from clinical practice coordinators
Relaxation	Relaxation in nature	Walking Running Enjoying nice weather
	Relaxation techniques	Meditation Yoga Breathing exercises
	Nothing helps	Feeling stress until all assignments are done
	'Tuning out'	Not thinking about study assignments Turning off your phone Taking time for yourself 'Giving your brain a brake' Retrieving from everything
	Socializing	Socializing with friends
	Substance use	Smoking Alcohol Energy drinks
	Conversation	Talking to peers Talking to loved ones Comparing experience with others

Table 3: Analytical themes development

Coping with stress in clinical environment

The participants in the focus groups related that they experienced stress even before they entered the clinical environment, mainly due to the uncertainty of the unknown. They stated they were influenced by the experiences and descriptions of the clinical practica of from discussions with other nursing students. They suggested that stress is greater at the beginning of a program of study. In a clinical environment, they suggested that the relationship between employees and patients was very important. One of the students mentioned:

"I was also stressed by this relationship that nurses have with patients. Nevertheless, we have chosen this profession, and you cannot allow yourself to have bad interpersonal relations, even if you are the grumpiest and have the worst day in the world ... It is not acceptable".

The nurse mentor in the clinical environment has a leading influence on how an individual experience the clinical environment. Students need a nurse mentor who offers supervision and one who communicates with students about their mistakes. Participants also mentioned:

"Sometimes we do not have a mentor, a person with qualifications in mentoring. Normally, we are left to ourselves most of the time... Too much responsibility can cause some extra stress. We are in situations that staff think that we know everything. We are only students, who are still learning. We need this time and leadership, so that they will supervise us and discuss our mistakes. Or warn you about the errors."

Occasionally, some students also found themselves in the potential role of a staff nurse for the first time, which was overly responsible for a novice student nurse. They stated:

"Sometimes they give you something to do, but you do know how to do it because you are a student, but they give you anyway and say to you, do it. The patient is a living person, and this causes some extra stress. "

Some nursing students believed that there was not too much of a workload, but they also thought extra work means more exposure to new learning:

"I do not think I'm too busy. By doing so, you get some new, other experiences, so that means that the more I do the better for me. I get more experience."

Conversely, some other student nurses felt that they had experienced work overload during their practicum.

Coping with stress in the academic environment

Participants believed that high levels of stress were pervasive throughout the academic year, particularly during the examination period. Participants suggested that the exam period and timetabling were too condensed with obligations to attend lectures for long periods. They added:

"Well, timetables are really full, so you do not have time to relax... We have obligations from 8 AM to 8 PM. I do not have time for myself. It is always like that. It is tough."

whilst another student added:

"The schedule in my opinion is (reflection), it is not well planned. We cannot be all day at the university, because half of us literally get up, go to university, eat in between, come home in the evening, lie down, and have nothing from the day."

Relaxation

Participants discussed the relaxation techniques that they were using, such as walking and running. Others stated that they tried to avoid stress. Especially, they highlighted that not thinking about study obligations, turning off the mobile phones, taking time for themselves, brainstorming, moving away from everything and thinking about pleasant things were positive interventions. They said: *"Many students try simple self-help stress techniques, such as, hanging out with their friends. They said: "I go out with my friend".*

It also means a lot to them, conversing with their peers or close relatives, especially the idea of sharing and comparing their experiences of stress with others.

Discussion

The study was designed to explore whether the introduction of a stress intervention program for student nurses, used during clinical practicum, reduced perceived stress and increased their satisfaction with life. Additionally, the researchers were interested in the type of relaxation techniques that were used by nursing students to cope with stressors. Findings indicate that students in the treatment group were in general satisfied with life, but experienced higher levels of stress (according to the mean PSS-10 score) than did the control group, even before the intervention. Also, the treatment group reported using relaxation techniques more frequently, which decreased their levels of stress. This finding concurs Manasinght et al. (2019) and Gallego-Gomez et al. (2020), which showed that the use of relaxation techniques, deep breathing techniques, combined with music is significantly correlated with a decrease in stress levels and anxiety; and the combination of progressive muscle relaxation (PMR) and music therapy was effective in decreasing stress and improving academic success (Inangil, et al., 2020; Ariga, 2019) [47-50].

In both groups there was a surge in the number of relaxation techniques used per week. Nursing students in the treatment group did not implement relaxation techniques frequently enough during their clinical practicum. Perhaps the nursing students were not intrinsically motivated enough and this was evidenced by their unreadiness to perform weekly reports on their use of relaxation techniques during their practicum, similar to Hamaideh et al. (2016) and Labrague et al. (2017) findings. Perhaps, nursing students were overwhelmed by their clinical practicum experiences and could not find the time to use relaxation techniques, or simply did not remember to use them; or indeed they did not see the value in using relaxation techniques to overcome stressors, which could be due to the fact that they were first year students and overwhelmed by the clinical practicum environment. For instance, Turner and McCarthy (2017) found that there is conflicting evidence about the effectiveness of different types of coping with stress interventions and consequently they could not conclude which type of intervention was most effective among nursing students. It cannot be concluded that relaxation techniques might not be as effective as other interventions, but is more readily available for someone presenting with distress due to stress. When conducting the interview analyses three analytical themes were formed from both the control and treatment groups, that is, coping with stress in clinical environment, coping with stress in academic environment and relaxation. Participants from both focus groups reported that they experienced more stress before they started their clinical practicum, because they were uncertain as to how they would work in this new environment for the first time. Also, they had an altered impression of clinical practicum, because older students shared some unpleasant experiences with them. Exercise was viewed as beneficial by both groups and this finding concurs with Ružič, (2016) and Aly's (2020) finding that physical activities and recreational opportunities impact in a positive way on students' well-being and stress. Both groups showed a small surge in their satisfaction with life (SWLS) after their clinical practicum, possibly due to exposure to the clinical aspect of their training and the consequent increase in their novice competencies and confidence. Nursing students in both groups described particularly stressful, rare situations, in the clinical environment such as, as death, the intensity of challenges in psychiatric units, the relationships with other employees and the attitude of other employees towards patients. This finding concurs with Frögéli et al. (2016, p. 2015) who highlighted other contributing factors, such as organizational stressors and especially in nursing and stated:
"It is important not to overlook the crucial role of organizational factors as contributors to problems of stress in nursing. Interventions focusing on individual factors should be regarded as complements, not substitutes, to organizational measures".

They also reported experiencing stress due to a lack of mentorship, which is another organizational contributing factor to stress. Considering the academic environment participants reported experiencing it as stressful the whole year not just during the exam period. What student nurses viewed as problematic were the academic and clinical timetables, which at times were excessively burdensome, whilst at other times were easier to manage.

Limitations

A number of study limitations need to be recognized. The sample size in the study was small, which was due to the type of clinical practica in this specialist area. A larger sample might have strengthened the findings. Cofounders also included the differences between the nonequivalent control and treatment group in terms of characteristics (threat of selection differences), which may have affected the results. It was not always possible to motivate students to use more relaxation techniques during their first clinical practicum. The first measurement might have affected how participants responded at the second measurement, which can artificially increase the effects (repeated measures bias). The focus group interviews could have had a longer duration, in order to explore more

issues that the results of the PSS-10 and SWLS scale evidenced (more integration of findings). The study only examined one student cohort over a 3-month period, therefore, further follow-up studies will be required to examine if learning relaxation techniques may affect perceived stress and satisfaction with life of nursing students for the duration of the theoretical and practical components of an undergraduate nursing program. Future studies could address stress intervention programs at three time points (Pre, mid, post) during a nursing program of study, so as to reinforce and reactivate stress management and preventative skills, learned during the theoretical component of the nursing program. The design of future similar studies could include a longitudinal design; the use of diaries, which would allow researchers to observe within subject changes; physiological stress indicators (for example, cortisol levels, heart rate and blood pressure etc.), and why there are absences from compulsory lectures or clinical practicum (absenteeism). In order to improve the validity of this type of research methodology, future research could appraise the methodological quality of such mixed methods in meeting the outcomes of the research questions, using an evaluation framework (Pace, et al., 2010; Pluye, et al., 2009). While there are notable limitations, a salient point is the need to do participant follow-up at 6 and 12 months, post interventions to ensure that reactivation of stress management and prevention skills are prompted.

Conclusion

This research raises important questions regarding the types of interventions that should be included in curricula, so as to enable students to alleviate stress, increase their satisfaction with life and improve patient safety and outcomes. Nursing students invariably encounter stress during the theoretical component of nursing programs and clinical practica, which frequently cause negative reactions and dissatisfaction with life. More discussion is required amongst educators, at both an organization and academic level, in relation to the types of multimodal stress interventions that could be used by students to ameliorate the effects of stress. In this regard attention could be focused on web/mobile based app programs, free targeted stress specific workshops for nurses. The inclusion of mandatory stress management and prevention modules in all nursing programs of study is a necessary consideration.

Compliance with ethical standards

Conflict of interest

The authors declare that there is no conflict of interest.

Informed consent

All participants who undertook the study gave informed consent.

Ethical approval

The protocol for the research was approved by the Ethical questions committee at the University. Provisions of the Declaration of Helsinki in 1995 were followed in the study.

Funding Statement

This research was supported by the European Social Fund under the “Innovative student projects for social good” scheme in 2017/2018.

Acknowledgment

Authors would like to thank all students who participated in this study.

Author contributions

Margaret Denny: conceptualization, methodology, validation, writing, supervision. Gregor Stiglic: conceptualization, data curation, methodology, writing. Polonca Borko: data curation, methodology, analysis, writing. Anja Stante: data curation, writing. Majda Pajnkihar: conceptualization, writing, supervision. Ajda Demsar.

References

1. Aly, E. R. (2020). Relational Factors on College Students' Interpersonal and Emotional Well-being. International Journal of Health, Wellness & Society, 10(1), 57–73.

2. Ariga, R. A. (2019). Decrease Anxiety among Students Who Will Do the Objective Structured Clinical Examination with Deep Breathing Relaxation Technique. Open Access Macedonian Journal of Medical Sciences, 7(16), 2619-2622.

3. Beanlands, H., et al. (2019). Decreasing stress and supporting emotional well-being among senior nursing students: A pilot test of an evidence-based intervention. Nurse Education Today, 76, 222-227.

4. Bhurtun, H. D., Azimirad, M., Saaranen, T. & Turunen, H. (2019). Stress and Coping Among Nursing Students During Clinical Training: An Integrative Review. Journal of Nursing Education, 58(5), 266-272.

5. Boram Lee, & Hye In Jeong. (2019). Construct validity of the perceived stress scale (PSS-10) in a sample of early childhood teacher candidates. Psychiatry and Clinical Psychopharmacology, 29(1), 76–82.

6. Cohen S, Kamark T, Mermelstein R. (1983). A global measure of perceived stress. Journal of Health & Social Behaviour, 24, 385–396.

7. Cheli, S., De Bartolo, P., & Agostini, A. (2020). Integrating mindfulness into nursing education: A pilot nonrandomized controlled trial. International Journal of Stress Management, 27(1), 93–100.

8. Chopra, S. (2019). Managing Uncertainty: Self-care tools for enhancing student learning experiences in the design disciplines. Ohio: University of Cincinnati.

9. Crawford G, Burns SK, Chih HJ, Hunt K, Tilley PM, Hallett J, et al. (2015). Mental health first aid training for nursing students: a protocol for a pragmatic randomised controlled trial in a large university. BMC Psychiatry, 15, 26.

10. Creswell, J. (2014). Research design: Qualitative, quantitative, and mixed methods approaches (4th ed.). Thousand Oaks, CA: Sage.

11. Creswell, J.W, & Plano Clark V.L. (2011). Designing and conducting mixed methods research. Thousand Oaks, California: Sage Publications.

12. Creswell, J.& Plano Clark, V. (2007). Designing and conducting mixed methods research. Thousand Oaks, CA: Sage.

13. Cook, T. D., & Campbell, D. T. (1979). Quasi-experimentation: Design & analysis issues in field settings. Boston, MA: Houghton Mifflin.

14. Dalky, H. F. & Gharaibeh, A. (2018). Depression, anxiety, and stress among college students in Jordan and their need for mental health services. Nursing Forum, 54(2), 205-212.

15. Denny, M., Denieffe, S. & Pajnkihar, M. (2017). Using a non-equivalent control group design in educational research . SAGE Research Methods Cases - Education.

16. Denny, M. (2010) Teaching for multiple intelligences in undergraduate education. In,M.D. Lytras et al. (Eds.), Tech-Education, 73, 690–691.

17. Devakani, J. S. M., Jayabharathi, B., Manonmani, K., Lavanya, L., & Rajeshwari, M. (2019). Assessment of Psychological Distress

among B.Sc Nursing Students at SRM College of Nursing. International Journal of Nursing Education, 11(3), 45–50.

18. Diener, E., Emmons, R. A., Larsen, R. J. & Griffin, S. (1985). The Satisfaction with Life Scale. Journal of Personality Assessment, 49(1), 71-75.

19. Frögéli, E., Djordjevic, A., Rudman, A., Livheim, F., & Gustavsson, P. (2016). A randomized controlled pilot trial of acceptance and commitment training (ACT) for preventing stress-related ill health among future nurses. Anxiety, Stress & Coping, 29(2), 202–218.

20. Gallego-Gomez, J. et al. (2020). Effectiveness of music therapy and progressive muscle relaxation in reducing stress before exams and improving academic performance in Nursing students: A randomized trial. Nurse Education Today, 84, 104217.

21. Galanakis, Michael & Lakioti, Agathi & Pezirkianidis, Christos & Karakasidou, Eirini & Stalikas, Anastassios. (2017). Reliability and validity of the Satisfaction with Life Scale (SWLS) in a Greek sample. The International Journal Of Humanities & Social Studies, 5, 120-127.Halcomb E, Hickman L. (2015). Mixed methods research. Nursing Standard, 29:41–7.

22. Hamaideh S.H., Al-Omari H., Al-Modallal, H. (2016). Nursing students' perceived stress and coping behaviors in clinical training in Saudi Arabia. Journal of Mental Health, Advanced Online Publication. Available from:

23. Hultell, D., & Gustavsson, J. P. (2008). A psychometric evaluation of the Satisfaction with Life Scale in a Swedish nationwide sample of university students. Personality and Individual Differences, 44(5), 1070-1079.

24. Inangil, D., Vural, P. I., Dogan, S. & Korpe, G. (2020). Effectiveness of Music Therapy and Emotional Freedom Technique on Test Anxiety in Turkish Nursing Students: A Randomised Controlled Trial. European Journal of Integrative Medicine, 33, 101041.

25. Jovanović, V. (2019). Measurement invariance of the Serbian version of the Satisfaction with Life Scale across age, gender, and time. European Journal of Psychological Assessment, 35(4), 555–563.

26. Karaman, M. A., Lerma, E., Vela, J. C. & Watson, J. C. (2019). Predictors of Academic Stress Among College Students. Journal of College Counseling, 22(1), 41-55.

27. Labrague, L. J., McEnroe-Petitte, D. M., Gloe, D., Thomas, L., Papathanasiou, I. V., & Tsaras, K. (2017). A literature review on stress and coping strategies in nursing students. Journal of Mental Health, 26(5), 471–480.

28. Lätsch, A. (2018). Does perceived stress moderate the association between depressive symptoms and socioemotional and behavioural strengths and difficulties in adolescence? Stress and Health, 34(2), 208–217.

29. Lorenzo-Seva, U., Calderon, C., Joan Ferrando, P., del Mar Munoz, M., Beato, C., Ghanem, I., Castelo, B., Carmona-Bayonas, A., Hernandez, R., & Jimenez-Fonseca, P. (2019). Psychometric properties and factorial analysis of invariance of the Satisfaction with Life Scale (SWLS) in cancer patients. Quality of Life Research, 28(5), 1255–1264.

30. Lovell GP, Nash K, Sharman R, Lane BR. (2015). A cross-sectional investigation of depressive, anxiety, and stress symptoms and health-behavior participation in Australian university students. Nursing Health Science, 17(1), 134–42.

31. Lu, J., Mumba, M. N., Lynch, S., Li, C., Hua, C. & Allen, R. S. (2019). Nursing students' trait mindfulness and psychological stress: A correlation and mediation analysis. Nurse Education Today, 75, 41-46.

32. Manansinght, S., Tatum, S. L. & Morote, E-S. (2019). Effects of relaxation techniques on nursing students' academic stress and test anxiety. Journal of Nursing Education, 58(9), 534-537.

33. Manap, R., Hamid, S. A., & Ghani, M. A. (2019). Depression, anxiety and stress among undergraduate students. E-BANGI

Journal, 16(2), 1–7.

34. McCarthy, B., Trace, A., O'Donovan, M., Brady-Nevin, C., Murphy, M., O'Shea, M. & O'Regan, P. (2018). Nursing and midwifery students' stress and coping during their undergraduate education programs: An integrative review. Nurse Education Today, 61, 197-209.

35. Pace, R., Pluye, P., Bartlett, G., Macaulay, A., Salsberg, J., Jagosh, J., & Seller, R. (2010). Reliability of a tool for concomitantly appraising the methodological quality of qualitative, quantitative and mixed methods research: A pilot study. 38th Annual Meeting of the North American Primary Care Research Group (NAPCRG), Seattle, USA.

36. Patton, M. Q. (2002). Qualitative research and evaluation methods 3rd ed. Thousand Oaks, CA: Sage, USA.

37. Pluye, P., Gagnon, M.P., Griffiths, F. & Johnson-Lafleur, J. (2009). A scoring system for appraising mixed methods research, and concomitantly appraising qualitative, quantitative and mixed methods primary studies in Mixed Studies Reviews. International Journal of Nursing Studies, 46(4), 529-46.

38. Rosenkranz, T., Takano, K., Watkins, E. R., & Ehring, T. (2020). Assessing repetitive negative thinking in daily life: Development of an ecological momentary assessment paradigm. PLoS ONE, 15(4), 1.

39. Ružič, K. M. (2016). Relaxation techniques and their impact on the experience of stress, self-esteem and social relationships in children; Diploma thesis. Maribor: University of Maribor.
Schoonenboom, J. & Burke Johnson, R. (2017). How to construct a mixed methods research design. Köln Z Sozio, 2(69), 107–131. 10.1007/s11577-017-0454-1

40. Shorten A. & Smith J. (2017). Mixed methods in research: expanding the evidence base. Evidence Based Nursing, ,20, (3), 74-75.

41. Stacey, G., Aubeeluck, A., Cook, G., & Dutta, S. (2017). A case study exploring the experience of resilience-based clinical supervision and its influence on care towards self and others among student nurses. International Practice Development Journal, 7(2), 1–16. https://doi.org/10.19043/ipdj.72.005.

42. Swami, V., & Chamorro-Premuzic, T. (2009). Psychometric evaluation of the Malay Satisfaction with Life Scale. Social Indicators Research, 92(1), 25-33.

43. Tančič Grum, A. & Zupančič-Tisovec, B. (2017). Relaxation techniques: a handbook for workshop participants. Ljubljana: National Institute of Public Health.

44. Torabizadeh, C., Bostani, S., & Yektatalab, S. (2016). Comparison between the effects of muscle relaxation and support groups on the anxiety of nursing students: A randomized controlled trial. Complementary Therapies in Clinical Practice, 25, 106-113.

45. Turner, K., & McCarthy, V. L. (2017). Stress and anxiety among nursing students: A review of intervention strategies in literature between 2009 and 2015. Nurse Education in Practice, 22, 21–29.

46. Yusufov, M., Nicoloro-SantaBarbara, J., Grey, N. E., Moyer, A., & Lobel, M. (2019). Meta-analytic evaluation of stress reduction interventions for undergraduate and graduate students. International Journal of Stress Management, 26(2), 132–145.

47. Vazquez, C., Duque, A., & Hervas, G. (2013). Satisfaction with life scale in a representative sample of Spanish adults: validation and normative data. Spanish Journal of Psychology, 16(82), 1-15.

48. Van Beuningen, J. (2012). The Satisfaction With Life Scale examining construct validity. Statistics Netherlands, The Hague/ Heerlen.

49. Vera-Villarroel, P., Urzúa, A., Celis-Atenas, P. P. K., & Silva, J. (2012). Evaluation of subjective well-being: Analysis of the satisfaction with life scale in Chilean population. Universitas Psychologica, 11(3), 719-727.

50. Wisdom J, Creswell J.W. (2013). Mixed methods: integrating quantitative and qualitative data collection and analysis while studying patient-centered medical home models. Rockville, MD: Agency for Healthcare Research and Quality.